TARGETING ARTHRITIS: THE NATION'S LEADING CAUSE OF DISABILITY

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Targeting Arthritis: The Nation's Leading Cause of Disability

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Introduction

The development and publication of the *National Arthritis Action Plan: A Public Health Strategy* (NAAP) catalyzed the public health system's interest in arthritis and emphasized population-based approaches. These approaches complement medical interventions to address arthritis at the individual patient level. Before the NAAP was published, few state health departments addressed arthritis. CDC's Arthritis Program, initiated after Congressional appropriations in fiscal year 1999, focuses on building a coordinated public health response to arthritis. A major part of this effort is to help develop state arthritis programs. In 2002, CDC is funding 36 state health departments to establish and enhance public health activities for arthritis, the nation's leading cause of disability.

The Burden of Arthritis

Arthritis encompasses more than 100 diseases and conditions that affect joints and connective tissues. Because of varying case definitions, different surveys produce different estimates of prevalence, but all confirm that arthritis is one of the most common diseases in the United States. According to the National Health Interview Survey (NHIS), arthritis affects nearly one of every six Americans.[1] Projections from these data indicate that, by 2020, an estimated 60 million people will be affected.[1, 2] Other surveys show that arthritis is the nation's leading cause of disability, limiting daily activities for more than 7 million Americans.[3]

Although all Americans are at risk for arthritis, the risk for this disease rises dramatically with age and is higher among women than men (Table 1).[1, 2, 4, 5] Indeed, over half of all people older than 65 have arthritis.[1,2] Surveys differ on the overall prevalence of arthritis and the prevalence by race and ethnic group. Data from the state-based Behavioral Risk Factor Surveillance System (BRFSS) indicate a higher prevalence of arthritis than do NHIS data. BRFSS data also suggest large racial and ethnic differences in prevalence (Table 1). However, according to the NHIS,[6] the self-reported prevalence of arthritis and other rheumatic conditions is similar among whites (15.5%) and blacks (15.4%), but activity limitations due to arthritis are more common among blacks (3.9%) than among whites (2.7%). Although Hispanics report a much lower prevalence of arthritis (11.2%), the proportion who have activity limitations due to arthritis is the same as that of whites (2.7%). Asians/Pacific Islanders also have a much lower prevalence of arthritis (7.2%), but a correspondingly lower proportion (1.1%) report arthritis-related activity limitations. The reasons for these racial/ethnic differences are not yet explained; some may result from different case definitions of arthritis and different methods used in the different surveys.

People with arthritis are often more vulnerable to stress, depression, anger, and anxiety because of pain, loss of functional ability, and fewer social contacts. Because of joint pain, people with arthritis may also be less physically active, placing them at higher risk for obesity, heart disease, diabetes, and high blood pressure. Compounding this picture are the enormous costs of treating arthritis and its attendant disability. These medical and social costs total almost $65 billion; the medical costs alone are $15 billion.[7]

Table 1. Prevalence of Arthritis Among Adults by Selected Characteristics—Behavioral Risk Factor Surveillance System, United States, 2001

Characteristic	Arthritis Prevalence		
	Percentage	95% Confidence Interval	Estimated No. (1000s)
Total	33.0	(32.7–33.4)	69,934
Age Group			
18–44	19.0	(18.5–19.4)	20,610
45–64	42.1	(41.5–42.8)	27,112
65+	58.8	(58.0–59.7)	21,704
Sex			
Male	28.4	(27.9–28.9)	28,926
Female	37.3	(36.9–37.8)	41,008
Race/ethnicity			
White, non-Hispanic	35.3	(34.9–35.7)	53,247
Black, non-Hispanic	31.5	(30.3–32.6)	6,330
Hispanic	23.3	(21.9–24.7)	5,796
Other	27.8	(26.2–29.3)	3,798

Source: Bolen J, Helmick CG, Sacks JJ, Langmaid G. Prevalence of self-reported arthritis or chronic joint symptoms among adults—United States, 2001. *MMWR* 2002;51(42):948-50.

The vision of CDC's Arthritis Program is to decrease pain and activity limitation and improve the quality of life for people with arthritis.

Healthy People 2010 Objectives

The *Healthy People* series provides a set of national health priorities every 10 years.[8] Because of the magnitude of the burden of arthritis and the relationship of arthritis-related physical inactivity to other diseases, *Healthy People 2010* sets forth a number of arthritis-related objectives. The following objectives are directly related to arthritis:

- Increase the mean number of days without severe pain among adults who have chronic joint symptoms (2-1).
- Reduce the proportion of adults with chronic joint symptoms who experience a limitation in activity due to arthritis (2-2).
- Reduce the proportion of all adults with chronic joint symptoms who have difficulty in performing two or more personal care activities, thereby preserving independence (2-3).
- Increase the proportion of adults with arthritis who seek help in coping if they experience personal and emotional problems (2-4).
- Increase the employment rate among adults with arthritis in the working-age population (2-5).
- Eliminate racial disparities in the rate of total knee replacements (2-6).
- Increase the proportion of adults who have seen a health care provider for their chronic joint symptoms (2-7).
- Increase the proportion of people with arthritis who have had effective, evidence-based arthritis education as an integral part of the management of their condition (2-8).

The following objectives are indirectly related to arthritis:

- Increase the proportion of adults who are at a healthy weight (19-1).
- Reduce the proportion of adults who are obese (19-2).
- Reduce the proportion of adults who engage in no leisure-time physical activity (22-1).
- Increase the proportion of adults who engage regularly, preferably daily, in moderate physical activity for at least 30 minutes per day (22-2).
- Increase the proportion of adults who engage in vigorous physical activity that promotes the development and maintenance of cardio-respiratory fitness 3 or more days per week for 20 or more minutes per occasion (22-3).
- Increase the proportion of adults who perform physical activities that enhance and maintain muscular strength and endurance (22-4).
- Increase the proportion of adults who perform physical activities that enhance and maintain flexibility (22-5).

Prevention Opportunities

Fortunately, much can be done to lessen the burden of arthritis and to meet *Healthy People 2010* objectives. Preventive strategies, the traditional focus of public health programs, can be *primary* (preventing arthritis from occurring), *secondary* (e.g., emphasizing early diagnosis and appropriate management), *tertiary* (e.g., increasing self-management activities to lessen pain and activity limitations), or some combination of the three. Currently, few primary prevention measures exist for arthritis, and effective secondary and tertiary prevention strategies are underused.

Primary Prevention

Being overweight is associated with increased risk for arthritis in general. In particular, weight loss reduces one's risk for osteoarthritis of the knee.[9] Physical activity not only helps prevent obesity but also maintains joint health and reduces one's risk for premature death, heart disease, and diabetes. Proper warm-up routines, strengthening exercises, and the use of appropriate protective equipment during physical activity can prevent traumatic injuries that may result in arthritis. Occupational injury prevention programs, especially those that reduce repetitive joint stresses, can also decrease the risk for arthritis.

Secondary Prevention

Early diagnosis and appropriate management of arthritis can be very beneficial, especially for people with inflammatory arthritis.[10] Early use of disease-modifying drugs (e.g., methotrexate for rheumatoid arthritis) can profoundly affect the course of some forms of arthritis by reducing joint destruction and improving long-term outcomes.[11] Some drugs can prevent exacerbations of arthritis; for example, drugs to control uric acid levels can help prevent attacks of gout.[10] Anti-inflammatory medications can help relieve pain and improve functionality.

Tertiary Prevention

Although joint replacement surgery is highly effective for reducing pain and improving functionality,[10] several nonsurgical strategies can reduce pain and disability, increase a person's sense of control, and improve the quality of life. The cornerstones of these strategies are *physical activity*, *weight control*, and *self-management education programs*.

Physical Activity

- An exercise program can improve aerobic capacity and lessen depression and anxiety among people with arthritis.[12-15]
- Regular exercise reduces pain and improves physical performance among older people with disabling osteoarthritis of the knee.[16, 17]
- PACE (People with Arthritis Can Exercise) is a community-based recreational exercise program in which trained instructors cover a variety of endurance-building activities, games, relaxation techniques, and health education topics. The program's demonstrated benefits include improved functional ability, decreased depression, and

increased confidence in one's ability to exercise (see www.arthritis.org/events/getinvolved/ProgramsServices/PACE.asp).[18]

Weight Control

- A randomized controlled study among women showed that the amount of weight lost was strongly correlated with improvements in signs and symptoms of knee osteoarthritis.[19]

Self-Management Education Programs

- The **Arthritis Self-Help Course** (ASHC) is an effective self-management education intervention for people with arthritis. The 6-week course consists of weekly 2-hour sessions guided by two trained instructors who follow a detailed protocol. Developed in the early 1980s at Stanford University and currently sponsored by the Arthritis Foundation, the ASHC reduces arthritis-related pain by 20%. By reducing physician visits by 40%, it also reduces overall health care costs, making it a highly cost-effective public health intervention (see www.arthritis.org/events/getinvolved/ProgramsServices/ArthritisSelfHelp.asp).[20, 21]
- **Arthritis Home Help Program,** a mail-delivered arthritis home study program, takes an individualized approach to developing self-care skills. Benefits include improvements in joint pain, mobility, and ability to communicate with physicians (see www.healthtrac.com/index.tam?Tame?SwitchTo=studies-pe-8).[22]
- **Arthritis phone service interventions** consist of initial telephone contact and follow-up by trained, nonmedical personnel who provide information, referral, and problem-solving strategies. People with osteoarthritis, rheumatoid arthritis, and lupus have shown improvements in physical and psychological health and pain as a result of these interventions.[23, 24]

More prevention research is needed to evaluate the effectiveness and cost-effectiveness of existing programs and community strategies, to develop new strategies to encourage people with arthritis to participate in self-management programs, and to develop new cost-effective self-management strategies. To be broadly effective, these strategies need to be adaptable to the needs of different age and racial/ethnic groups.

The National Arthritis Action Plan

To address this enormous health problem and promote the widespread use of these proven interventions, a national strategy was developed under the leadership of the Arthritis Foundation, the Association of State and Territorial Health Officials, and CDC and released in 1998 (see www.cdc.gov/nccdphp/arthritis/index.htm).[25] The NAAP represents the work of nearly 90 organizations, including governmental agencies, voluntary organizations, academic institutions, community interest groups, professional associations, and others with an interest in arthritis prevention and control. The NAAP focuses on three strategic areas to reduce the prevalence of arthritis and accompanying disability:

- Surveillance, epidemiology, and prevention research.
- Communications and education.
- Programs, policies, and systems.

The goals of the plan include increasing public awareness of arthritis as an important public health problem, preventing arthritis, promoting early diagnosis and appropriate management, minimizing preventable pain and disability, providing resources for coping with arthritis, and ensuring that people with arthritis receive the support they need. A major recommendation for accomplishing these goals is to build the capacity for supporting arthritis programs into the public health infrastructure.

National Leadership

Following the release of the NAAP, Congress, for the first time, appropriated funds in fiscal year 1999 for CDC to initiate a public health response to arthritis. The CDC Arthritis Program is working to develop an integrated public health approach to both monitor the burden of arthritis and foster programs to reduce that burden. The core activities of the

resulting CDC Arthritis Program focus on three key areas:

- *Strengthening the Arthritis Public Health Science Base*

  Consistent with the goals of the NAAP, CDC's public health science activities focus on surveillance, epidemiology, and prevention research. Working with state Arthritis Program partners and others, CDC revised surveillance methods used to estimate the burden of arthritis. This revision included establishing a uniform case definition, revamping arthritis surveillance questions, and ensuring that identical arthritis questions are used in the NHIS (used for national prevalence estimates) and the BRFSS (used for state-level estimates). CDC also funds a variety of extramural prevention research projects to strengthen the science base for arthritis.
- *State Arthritis Programs*

  In 1999, CDC funded the development of arthritis programs in 37 states. By 2002, 28 states were funded at an average level of $120,000 to establish the basic public health foundation necessary to support a state arthritis program and initiate at least one community-based intervention program. Eight states were funded at an average level of $320,000 to further strengthen their public health infrastructure for arthritis intervention activities.
- *Intervention Activities*

  The CDC Arthritis Program plays a key role in implementing the NAAP by developing and supporting health communications, health education, and health care system interventions to be used by state programs and their partners to address arthritis.

CDC is only one of many agencies working to achieve the goals of the NAAP. CDC's work complements the work of others such as the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) (see www.niams.nih.gov/an/index.htm) and the Arthritis Foundation (AF). (See www.arthritis.org.) NIAMS supports research into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases, trains basic and clinical scientists to carry out this research, and disseminates information on the progress of research into these diseases. The AF provides information and self-management services to people with arthritis and their families.

Infrastructure to Support State Programs

Program Management and Administration

A strong system of management, staff, and support is necessary to effectively address arthritis at the state level. An arthritis program in a state health department should have the following competencies and capacities:

- Leadership for overall program coordination and implementation.
- Surveillance and data collection and analysis to assess the burden of arthritis, arthritis-related disability, risk factors, and policy and program functions.
- Appropriate staff with defined lines of authority.
- A partnership or advisory committee.
- Health communications activities.
- Implementation expertise and services to provide appropriate support for community-based intervention programs.
- Policy support for arthritis program activities.
- Accountability to ensure that programs are implemented with integrity and evaluated for effectiveness.

Ideally, the program should be organizationally located in an area with easy access to partner programs such as those addressing physical activity, aging, injury control, and obesity prevention. Partnerships, especially with the AF, will be needed. Other agencies interested in arthritis should also be sought out as partners.

Programmatic Focus

Because of typically limited resources for early program efforts and the existence of other programs

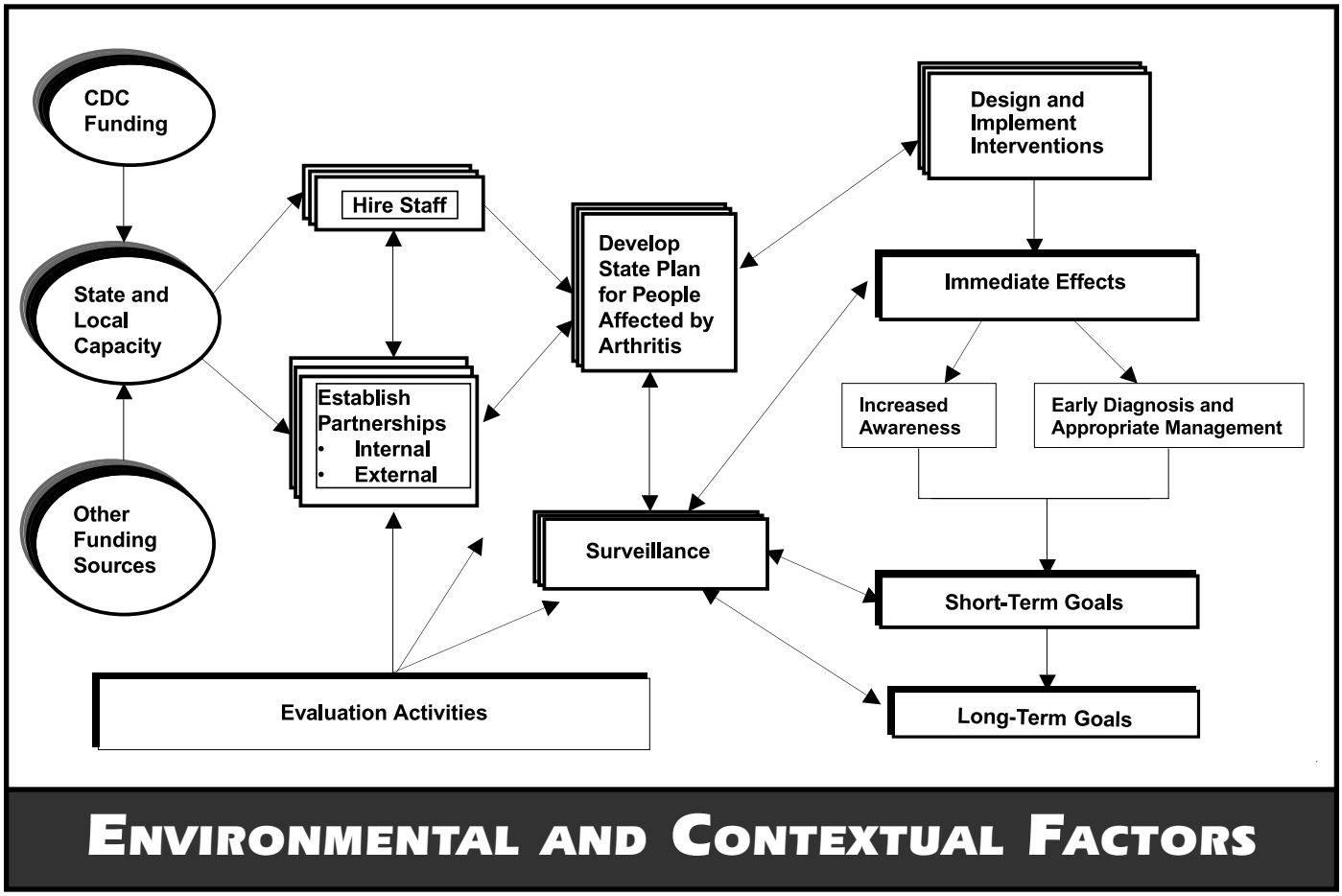
addressing risk factors for some types of arthritis (e.g., weight control and injury prevention for osteoarthritis), we recommend that initial state program efforts focus on people already experiencing the pain and disability associated with arthritis, their families, health care providers, and others treating or providing services for people with arthritis. These secondary and tertiary interventions targeting people with arthritis can have immediate effects on disability and improve quality of life.

The implications of this recommended focus are that successful programs aim to increase early diagnosis and appropriate management of arthritis; increase self-management of arthritis; and, ultimately, decrease pain and disability and improve quality of life. Accordingly, these programs must promote

- Awareness of the signs, symptoms, and options for management of arthritis.
- Awareness of the need for early diagnosis and appropriate management.
- Self-management as part of routine medical care for arthritis.
- Participation in self-management programs.

To accomplish these ends, we recommend that a state program have 1) a well-thought-out plan of action, 2) appropriate partnerships, 3) surveillance systems with arthritis-specific capability, 4) the ability to implement interventions, and 5) evaluation capability (Figure 1).

Figure 1. CDC-State Arthritis Programs: A Revised Public Health Framework



State Plans

A state arthritis plan is a plan developed by partners to decrease the burden of arthritis in the state. It describes a shared vision and details a well-thought-out plan of action for what needs to be done by the many partners concerned about arthritis. To a large extent, the process of developing a state plan serves as a catalyst to develop and strengthen partnerships, explore resources and identify gaps, secure commitments from partners to take responsibility for specific functions or services, and clearly articulate a common vision for how a state arthritis program will evolve.

Ideally in alignment with *Healthy People 2010* and the NAAP objectives, a state plan should be a dynamic document that includes plans for periodic updates and uses the most current data. States should have a clear approach for disseminating the plan, including such issues as who the plan's target audiences are and how they will be made aware of the plan. The CDC-recommended components of a state arthritis plan include the following:

- *Burden.* Describe the burden and impact of arthritis in the state using the best available data. Use state-specific data if possible. Update as new data become available.
- *Lessening the burden.* Describe what could be done better in the state to decrease the burden of arthritis. Making this case clearly may help influence policy makers and other potential partners to support the plan. Delineate the role of public health agencies and other partners in lessening the burden.
- *Existing capacity.* Describe current resources and resource gaps in the health department and among partners. Because plans need to consider the state's unique environmental and contextual factors (e.g., the availability of self-management courses, awareness of these programs and ease of accessing them, relationships among health systems in the state, and population insurance coverage), a needs assessment is necessary to identify current resources and gaps for all partners, including the health department.
- *Core capacities and functions.* Describe the capacities and functions needed to conduct an arthritis program, including leadership for coordinating and implementing the program, staff requirements and organizational location, policy support, surveillance and data collection, partnerships, health communications, and accountability to ensure that programs are evaluated for effectiveness.
- *Objectives and activities.* Detail program goals and measurable objectives, and outline activities and strategies to achieve the objectives. Explain how the activities will achieve the intended outcome. For each objective and activity, describe the target population, the channel or venue to be used, the evaluation plan, the resources needed, the partners involved, and the staff required to conduct the activity and ensure that the objective is achieved. Because all objectives are unlikely to be immediately achievable with existing resources, a plan should specify the activities to be done first (the priorities) and those to be undertaken later.
- *Resources.* Estimate what resources and funds are needed for varying components of the plan and what is available (cash and in-kind).
- *Time line.* Provide a time line for implementing activities, given available resources. We recommend a 5-year time frame for the plan.

Examples of state plans can be found at www.cdc.gov/nccdphp/arthritis/states.htm.

The NAAP provides a broad framework for addressing arthritis from a public health perspective and may also provide a useful perspective for planning at the state and local level.

Partnerships

Addressing arthritis will require a shared vision and the coordinated work of multiple organizations, including governmental, public, and private organizations; public health, medical care, and social service agencies; and a variety of nontraditional partners. These multi-disciplinary partnerships should coordinate activities among public- and

A State Success Story: The Michigan State Plan Development

Michigan Arthritis Program staff asked its primary partners (the Arthritis Foundation Michigan Chapter and the University of Michigan Rheumatology Program) to identify knowledgeable and influential people to help develop an arthritis plan for the state. A 25-member steering group was then formed and began a four-step process.

Step 1: Discovery Meetings
Three regional meetings were held to get input. At each site, two local hosts (a public health agency and a hospital or health care organization) helped invite those with crucial perspectives—people with arthritis and agencies like the Detroit Parish Nurse Network, Senior Centers, Area Agencies on Aging, the Governor's Council on Physical Fitness, and local employers. Each attendee addressed three questions:

- What services are now available for people with arthritis?
- What problems do people with arthritis face?
- What could be done to address those problems?

Through news releases, Internet postings, and radio spots, the public was invited to give input.

Step 2: The Scientific Forum
National arthritis experts presented the latest research on arthritis at a forum and also commented on possible recommendations made during Step 1.

Step 3: Consensus and Public Comment
The steering committee reached consensus on the plan based on the public and expert input. A draft plan was made and subjected to public comment for a month, after which it was finalized.

Step 4: The Launch
The *Michigan Arthritis Action Plan* was launched at a well-attended press conference held at the state capitol. At this point, Michigan realized it had achieved three outcomes:

- It had a science-based plan that was really doable.
- There was an unprecedented level of awareness that arthritis was an issue needing to be addressed.
- Perhaps most importantly, it had a group of partners ready to dig in and get to work.

private-sector organizations and agencies to ensure a comprehensive approach to arthritis. Partners can work together to address barriers and gaps in service, identify where disparities exist and resources are lacking, generate advocacy and commitment to reduce the burden of arthritis, and identify and share effective strategies. The state health department should also work with academic institutions and other partners to ensure that the results of social, behavioral, and medical science research are translated into sound public health practice and that program interventions and evaluations are based on science. Because activities are conducted at the local level, the involvement of local-level partners in generating the plan is critical to ensure that the planned activities will occur.

The following actions should help state health departments build and strengthen partnerships:

- Strengthen alliances among community organizations (e.g., health departments, Arthritis Foundation chapters, Medicaid agencies, voluntary health agencies, AARP, Area Agencies on Aging, senior centers, and faith communities).
- Establish arthritis advisory boards or incorporate arthritis into existing advisory boards with similar goals.
- Form alliances with organizations that focus on weight control and physical activity.
- Foster collaboration among employers and employer networks, their health plans, managed care organizations, and public health agencies.
- Form partnerships within the health department among programs (e.g., cardiovascular disease, diabetes, nutrition) that are addressing common risk factors (e.g., obesity, physical inactivity). Programs can develop these links through activities such as referring clients to other programs as appropriate (e.g., the arthritis program refers an obese client to the nutrition program), promoting other programs' messages and activities in printed materials, and combining approaches to external partners with the same interests, such as those involved in developing walkable communities to promote physical activity.
- Develop community and business coalitions and train members to promote and raise awareness of key arthritis issues.

Surveillance

Surveillance at the state level is essential for assessing the burden of arthritis; describing how arthritis affects various subpopulations; monitoring trends over time; and informing decision-making for targeting interventions, allocating resources, and shaping state health policy. Surveillance of arthritis in general involves two broad paradigms:

1) Self-reports take into account whether people have joint symptoms associated with arthritis or have been told by a physician that they have arthritis. The self-report of joint symptoms captures the large proportion of people who do not consult the health care system about these symptoms. Self-report of joint symptoms and/or physician diagnosis is used in the BRFSS to define a case of arthritis.
2) A *medical classification system* is applied to health care data (e.g., insurance claims, encounter data, hospitalizations, ambulatory care) that have diagnoses coded using the *International Classification of Diseases, Ninth Edition, Clinical Modification (ICD-9-CM)*. The National Arthritis Data Workgroup has developed a standard definition for arthritis using *ICD-9-CM* codes (see www.cdc.gov/nccdphp/arthritis).[2] Used with health care data systems based on *ICD-9-CM,* these arthritis codes can help to better define the burden of arthritis.

CDC recommends that each state directly gather data with the BRFSS modules on arthritis (six questions), health-related quality of life, physical activity, body mass index, and weight control practices. An optional four-question BRFSS arthritis module covers additional issues of programmatic importance (see www.cdc.gov/nccdphp/arthritis). Because so much of arthritis care occurs in ambulatory care settings or outside the medical care system altogether, we also recommend that, when possible, states supplement the BRFSS with additional state-based data from outpatient or ambulatory care settings, managed care organizations, and follow-back surveys of BRFSS respondents to acquire more detailed information. Pharmacy data may also prove useful to better define the burden of arthritis and how it is treated. Again, when possible, states should monitor trends in relevant *Healthy People 2010* arthritis objectives by adding questions to the BRFSS or special studies. To allow states to gauge if their programs are achieving the desired effects, states would ideally also collect data on changes in the following:

- Awareness of the signs and symptoms of arthritis and the management options available.

- Awareness of the need for early diagnosis and appropriate management.
- Participation in arthritis self-management programs.
- Early diagnosis and appropriate management of joint symptoms and arthritis.
- Pain, disability, and quality of life among people with arthritis.
- Inclusion of self-management as part of routine medical care for arthritis.

A number of BRFSS-related measures generated from core and optional module questions can be used to track the progress and outcomes of the state arthritis program. Examples of such indicators include

- Mean reported healthy days among people with arthritis.
- Proportion of people with arthritis reporting limitations and the severity of these limitations.
- Proportion of working-age people with arthritis who are employed.
- Proportion of people with arthritis reporting that arthritis or joint symptoms affect their work.
- Proportion of people with chronic joint symptoms who have sought medical evaluation for the symptoms.
- Proportion of people with arthritis who report regular physical activity.
- Proportion of people with arthritis who are not overweight.
- Proportion of overweight people with arthritis reporting that their doctor advised them to lose weight.
- Proportion of people with arthritis who report ever having taken a class on arthritis self-management.
- Proportion of people with arthritis reporting that their doctor suggested physical activity to help their arthritis or joint symptoms.

Findings from surveillance should be routinely translated and communicated in easily understandable terms. Data should be quickly and routinely disseminated by creating "State of Arthritis" reports, and the data should be incorporated into ongoing updates of the state plan.

The ultimate goal of state arthritis surveillance is to define the burden of arthritis and other program-related factors in a manner that informs public health decision-making and programmatic direction. Achieving this goal requires that states allocate sufficient resources and staff time toward surveillance, data management, evaluation, planning, and other expenses associated with timely surveillance efforts. States also need to establish standards for data analysis and timely reporting and provide training and technical assistance on collecting, analyzing, and using data.

Interventions

Because the target population is people affected by arthritis, CDC recommends that states choose from the program components outlined on pages 3–4 that focus on secondary and tertiary levels of prevention. The pain and disability accompanying many types of arthritis may be minimized through early diagnosis and appropriate medical management, weight control, physical activity, appropriate self-management, physical and occupational therapy, and joint replacement surgery.

Community-Based Programs

At the community level, CDC recommends that state programs develop interventions to promote self-management among people with arthritis. Elements of successful approaches include the following:

- Use *Healthy People 2010* objectives on arthritis to establish community program goals.
- Target broad social and environmental changes to complement individual change.
- Encourage representatives of the target population to participate in program planning, design, implementation, and evaluation.
- Conduct community assessments to identify perceived arthritis needs and resources.

- Coordinate community resources and identify consistent, convincing, and scientifically sound arthritis messages delivered through health care services, places of worship, workplaces, media, and other pertinent channels.
- Increase the local availability of self-management classes and other tertiary prevention strategies, such as physical activity and weight control programs. (See Prevention Opportunities section, pages 5-3–5-5.) Coordinate these strategies with other health department programs targeting common risk factors.
- Promote physical activity as the social norm through community policy and environmental strategies and make opportunities for physical activity safe, accessible, fun, and supportive. (See Chapter 7 for detailed recommendations.)
- Target various subpopulations. Programs targeting the following subpopulations at higher risk for arthritis and limitations from arthritis are likely to be more cost effective than those targeting the community as a whole:
  - Women.
  - Minorities, particularly African Americans and Hispanics.
  - People with low levels of education and income.
  - Older adults.
- Develop community resource packages on how to promote early diagnosis and appropriate management (including self-management) of arthritis and how to delay arthritis-related disability.
- Educate private-sector business leaders on the costs and benefits of providing arthritis information and services to employees. For example, it might be cost-effective for a business to contract with a vendor to educate employees on arthritis self-management to reduce the work time lost due to sick leave. In addition, states may need to provide technical assistance to help employers who are purchasing health insurance coverage ensure that arthritis issues are included in the package of health care benefits.

State Arthritis Program in Action: Alabama

With CDC support, Alabama developed and is evaluating a community project in an underserved, rural African American community. This project involved the community in developing resources for arthritis, including the delivery of the Arthritis Self-Help Course (ASHC). This project found that delivering this course is feasible and seems effective in this community. Increased delivery of the ASHC to rural minority populations is likely to have significant health benefits. In addition, because of the partnerships developed through this program, a rheumatologist travels 2 hours from Birmingham once a month to offer specialized care for people with arthritis in this area.

- Train staff and volunteers from a variety of organizations.

Systems Changes

Because physical activity, weight control, and self-management programs are effective in alleviating arthritis pain and minimizing activity limitations, CDC recommends that state programs engage managed care and health care providers in routinely providing these services to people with arthritis. Self-management programs can be cost saving for a managed care organization.[20-21] Systems interventions should ensure that appropriate facilities and programs (e.g., self-management courses) are available at the community level and may include routine referral to such by health care providers.

The Improving Chronic Illness Care program at Group Health Cooperative of Puget Sound has pioneered a comprehensive system change approach to quality improvement in chronic illness care. This approach combines the system changes suggested by their chronic care model with rapid-cycle quality improvement methodology developed by the Institute for Healthcare Improvement. This system

change approach has been used very successfully in diabetes care and has also been used to improve care for congestive heart failure, asthma, and depression.[26] Such an approach may be useful for arthritis.

Health Communications

A necessary part of interventions is a health communications strategy. The overarching communications goal for an arthritis campaign is to increase awareness, knowledge, and beliefs necessary for appropriate management of arthritis, ultimately leading to increased quality of life among people affected by arthritis. Appropriate management includes early diagnosis, appropriate medical treatment, and self-management techniques.

Messages need to reach three broad audiences: the public, people with arthritis and their families, and health professionals. The content and delivery mode of messages may need to be tailored for subgroups within each of the three main audiences. However, for all audiences, messages should contain accurate, clearly stated information and should convey that something can be done about arthritis.

As an example, CDC has recently launched a campaign to promote physical activity among Caucasians and African Americans aged 45–64 years with lower income and education whose arthritis affects or threatens to affect their life roles. The campaign's theme line is *"Physical activity. The arthritis pain reliever*." Initial communications objectives are to

- Increase the belief that self-management is an important part of arthritis management.
- Increase the audience's confidence in their ability to perform self-management behaviors, specifically regular, moderate physical activity.
- Increase trials of self-management behaviors, specifically moderate physical activity.

Health communications activities should be part of a larger plan to address factors affecting behavior (e.g., social norms, policies, economics, the environment) and should be incorporated into the plan at an early stage. The CDCynergy program can assist states in planning communications activities. Additional recommendations are to

- Incorporate an evaluation component in communications activities from the start. Much needs to be known about communication's role in changing arthritis-related behavior.
- Be culturally sensitive and competent in developing strategies and messages, conducting research, and implementing and evaluating communications efforts.
- Ensure that the audience receives a single, simple, specific, and consistent message targeted to them. Communications planners will need to make difficult decisions about which of the many possible arthritis messages should be the focus and which should be left for a later time. Methods that can help communicators develop effective messages include conducting formative research, segmenting the audience, and using a social-marketing or consumer-oriented approach to look at the problem and possible solutions from the audience's point of view.
- Conduct qualitative and quantitative audience research to help understand the audience's perception of specific concepts and their ability to do what is being asked. Research should include formative research, pretesting of concepts and messages, and monitoring during the program.
- Examine the wide range of actual and perceived barriers and incentives for healthy (and unhealthy) behaviors and address them. Social marketing provides a useful framework for thinking about how to make behavior change easier.
- Remember that health messages are heard or seen in a context of numerous competing messages in the media, on the Internet, and from family and friends, and consider this context in developing communications strategies and messages.

Evaluation

CDC recommends an existing set of measures for gauging initial program progress (see www.cdc.gov/nccdphp/arthritis). These measures address resources

and staffing, appropriate and effective partnerships, analysis and use of data in decision-making, and endorsement and dissemination of state plans.

Intermediate outcome evaluation measures for programs should include rates and trends of surveillance indicators. Examples include mean reported healthy days among people with arthritis and the proportion of people with arthritis reporting the following: activity limitations, getting regular physical activity, not being overweight, having been advised by a doctor to be physically active, ever having taken a class on self-management, and having their work affected by arthritis or joint symptoms. Additional measures of interest include the proportion of overweight people whose doctor advised them to lose weight, the proportion of people with chronic joint symptoms who have sought medical evaluation for the symptoms, and the proportion of working-age people with arthritis who are employed.

Ultimately, programs should be evaluating changes in the following measures among people with arthritis:

- Awareness of the signs and symptoms of and management options for arthritis.
- Awareness of the need for early diagnosis and appropriate management.
- Self-management attitudes and behaviors.
- Participation in self-management programs.
- Early diagnosis and appropriate management among people with joint symptoms and arthritis.
- Physical, psychosocial, and work function.
- Pain, disability, and quality of life.
- Inclusion of self-management as part of routine medical care for arthritis.

Programs should periodically evaluate the state plan to review progress toward accomplishing overall goals and objectives and to assess the need for redirecting activities or resources. Program components should be evaluated regularly using a broad range of both qualitative and quantitative measures to ensure that a mixture of process, immediate impact, and long-range outcome information is used to determine effectiveness.

Using methods that are congruent with the state plan, programs should conduct process evaluation to objectively describe program elements and implementation. This level of evaluation should be used to guide adjustments to plans and implementation strategies to improve the quality, effectiveness, and efficiency of activities. Programs must also evaluate the fidelity of program implementation to make sure that proven interventions are delivered as they should be. Examples of potential process evaluation components for a community-based program include the number and demographic characteristics of those reached through the program and the program's budget details, including funding sources and program expenses. Training needs should also be evaluated.

Those who have a direct interest in the program's initiatives should have the opportunity to participate in evaluation activities. Such stakeholders may include those who participated in developing the state plan, health care providers, community representatives, and policy makers. Including stakeholders in evaluating program initiatives can increase the relevance, clarity, and integrity of evaluation results and improve the likelihood that the results will be used. Partners not involved in evaluation efforts should be advised of the evaluation's progress and outcomes and its potential relevance to their activities.

Evaluation results and lessons learned should be disseminated through written reports and presentations at national and state meetings and conferences. Partner organizations such as the Arthritis Foundation and other state agencies can also help disseminate program evaluation results by making them available to their members and constituents.

Professional Development and Training

Well-trained state and local health department staff are essential for effectively monitoring the burden of

arthritis and for designing, implementing, and evaluating public health interventions to reduce this burden. State health departments are responsible for guaranteeing that staff receive the appropriate training to perform these functions. In addition, ongoing training for all staff should be available as the arthritis program evolves or new scientific or programmatic developments occur.

Training can include formal education programs and technical assistance and less formal training methods such as peer communications. Key areas for training include information about arthritis and its management, reaching diverse populations, the continuum of prevention strategies, program planning and evaluation, health communications, and use of surveillance data. Current training resources include the following:

- Formal Internet-based training modules on The Arthritis Challenge, and Arthritis: The Public Health Response, developed by the Association of State and Territorial Directors of Health Education and Public Health Education (ASTDHPPHE) and hosted on its Web site. (See www.astdhpphe.org.)
- Informal training available through the annual Arthritis Program grantee meetings, with conference proceedings also available on the ASTDHPPHE Web site.
- Peer communications through conference calls and the Arthritis Program grantee bulletin board.

Future training opportunities include a biannual distance-based-learning conference that will likely be broadcast via satellite and the World Wide Web. In addition, states are encouraged to work with state partners, including the AF chapters (see www.arthritis.org), to both share training resources and develop new training materials. The following activities may also be considered:

- Assess training needs throughout the state.
- Use the results of the needs assessment to develop a rigorous, comprehensive training and professional development program consisting of a wide range of opportunities, from continuing education classes and technical assistance sessions to peer communications networks. Use already developed training materials and courses if appropriate.
- Increase the number of organizations and individuals involved in planning and conducting community-level education and training programs.

Training should also address the need for more trainers for interventions such as PACE (People with Arthritis Can Exercise) and the Arthritis Self-Help Course. Health care providers and staff of managed care organizations may benefit from training in the appropriate management of arthritis and in the referral of patients to appropriate community programs and other resources in their area. Partnerships with health care delivery systems and professional organizations will help to accomplish such training.

Funding

States beginning to develop programs should focus on providing leadership to monitor the burden of arthritis in the state, to develop and foster partnerships among agencies addressing arthritis, and to catalyze the development of a state plan. The following resources are needed to establish a program:

Funds: $120,000
Staff: One full-time program manager

As program resources increase, activities should expand. A more comprehensive program should have the capacities and competencies needed to develop, implement, and evaluate community-based programs to decrease the burden of arthritis in the population. The following resources are needed for a more comprehensive program:

Funds: $300,000 to $1,250,000
Staff: Project manager, epidemiologist, evaluator, programmer, intervention specialist, health communications specialist

Progress to Date and Challenges Ahead

The CDC Arthritis Program is working to develop an integrated public health approach to monitor the burden of arthritis, to support and conduct prevention research to ensure that we have the best interventions for community-based efforts, and to foster programs to reduce the impact of arthritis in the United States. The overall goal of both CDC and state arthritis programs is to increase the quality of life among people affected by arthritis by decreasing pain and disability and increasing function. Increasing self-management beliefs and behaviors, such as being physically active, is key to achieving the goals of these programs.

As the public health system has mobilized to address arthritis, several population-based approaches have emerged; these include health communications campaigns, changes in health systems to incorporate routinely assessing and addressing self-management education needs and physical activity among people with arthritis, and community-based strategies to increase physical activity and access to and availability of evidence-based self-management education programs. There are three major challenges ahead:

- *We need more interventions.* The types of evidence-based interventions (e.g., self-management education and programs to increase physical activity) currently available are not sufficient to meet the needs of all people with arthritis. Additional interventions are needed that are relevant to the diverse groups of people affected by arthritis. Programs that vary in content and are delivered in different ways (e.g., Web-based, classroom) are needed.
- *We lack adequate information on how best to deliver evidence-based programs.* For instance, where are the best places to reach people with arthritis? How does this differ among different groups? How can we work with large and small employers to reach people with arthritis? What are the natural, synergistic partnerships to deliver interventions? How can arthritis messages be delivered through other programs? What are the characteristics of successful partnerships to best serve the needs of people with arthritis?
- *We lack sufficient capacity to deliver available evidence-based interventions.* How much capacity should be available at the state and local health department level? How can we develop this capacity? How do we develop partnerships with others to maximize our respective efforts?

Technical Resources Available on the World Wide Web

Action plans

National Arthritis Action Plan—The consensus action plan from more than 90 organizations for a public health approach to arthritis:

www.cdc.gov/nccdphp/arthritis/index.htm

Examples of state plans that illuminate varying approaches to dealing with arthritis at the state level:

www.cdc.gov/nccdphp/arthritis/states.htm

Surveillance

The CDC Arthritis Program's recommended BRFSS case definition for arthritis:

www.cdc.gov/nccdphp/arthritis

The National Arthritis Data Workgroup's recommended *ICD-9-CM* codes for the 100-plus conditions that represent arthritis and other rheumatic conditions:

www.cdc.gov/nccdphp/arthritis

Grouping of *ICD-9* codes for analysis of broad rubrics:

www.cdc.gov/nccdphp/arthritis

Healthy People 2010's eight objectives directly related to arthritis:

www.health.gov/healthypeople/Document/HTML/Volume1/02Arthritis.htm#_arthandother

Interventions

Arthritis Self-Help Course, a 6-week course that is an effective self-management education intervention for people with arthritis:

www.arthritis.org/events/getinvolved/ProgramsServices/ArthritisSelfHelp.asp

PACE, a community-based recreational exercise program with demonstrated benefits for people with arthritis:

www.arthritis.org/events/getinvolved/ProgramsServices/PACE.asp

Evaluation

The CDC Arthritis Program's matrix for evaluating state arthritis programs:

www.cdc.gov/nccdphp/arthritis

A collection of evaluation aids and guidance:

www.cdc.gov/eval/resources.htm

Training

The Arthritis Challenge, a modular course teaching the basics about arthritis, including epidemiology, prevention, and treatment, and Arthritis: The Public Health Approach, a modular course on applying public health measures to control arthritis in the community setting:

www.prospectassoc.com/arthritis/

2000 Arthritis Grantee Meeting proceedings—Lectures and slides from the 2000 annual meeting covering a variety of programmatic issues and discussions:

www.astdhpphe.org/confarth/agenda.htm

General information about arthritis

Arthritis Foundation:

www.arthritis.org

Lupus Foundation of America:

www.lupus.org

National Institute of Arthritis & Musculoskeletal Diseases:

www.nih.gov/niams

Johns Hopkins arthritis site:

www.hopkins-arthritis.org

American College of Rheumatology:

www.rheumatology.org/index.asp

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